



Figure 24. Bivalent chromatin. (A) Bivalent chromatin domains are characterized by the coexistence of active H3K4me3 and repressive H3K27me3 histone marks and are often found at promoter regions of developmentally regulated genes in pluripotent cells. Upon differentiation, this poised chromatin state is altered, which results in either gene activity or gene repression. This concept is illustrated for the “bivalent” *Olig1* gene. (B) Within a bivalent nucleosome, H3K4me3 and H3K27me3 do not occur on the same H3 tail, but are present on the two different H3 tails. This asymmetric distribution needs to be resolved to convert bivalent chromatin into an active (containing only H3K4me3) or a repressed (containing only H3K27me3) chromatin state. (A, Adapted from Mikkelsen et al. 2007.)